

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



FILED

03/24/22

09:31 AM

A2010011

Application of Pacific Gas and Electric
Company (U39M) for Approval of its
Proposal for a Day-Ahead Real Time Rate and
Pilot to Evaluate Customer Understanding and
Supporting Technology.

Application No. 20-10-011
(Filed October 23, 2020)

U 39 M

**SUBMISSION OF PACIFIC GAS AND ELECTRIC COMPANY'S
PROPOSAL FOR EXPORT COMPENSATION FOR NON-NEM
CUSTOMERS PURSUANT TO ADMINISTRATIVE LAW JUDGE
SISTO'S JANUARY 14, 2022 RULING**

GAIL L. SLOCUM
SHIRLEY A. WOO
BEN ELLIS

Pacific Gas and Electric Company
77 Beale Street
San Francisco, CA 94105
Telephone: (415) 830-7742
Facsimile: (415) 973-5520
E-Mail: Shirley.Woo@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: March 24, 2022

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of Pacific Gas and Electric Company (U39M) for Approval of its Proposal for a Day-Ahead Real Time Rate and Pilot to Evaluate Customer Understanding and Supporting Technology.

U 39 M

Application No. 20-10-011
(Filed October 23, 2020)

**SUBMISSION OF PACIFIC GAS AND ELECTRIC COMPANY'S
PROPOSAL FOR EXPORT COMPENSATION FOR NON-NEM
CUSTOMERS PURSUANT TO ADMINISTRATIVE LAW JUDGE
SISTO'S JANUARY 14, 2022 RULING**

Pursuant to Administrative Law Judge Sisto's January 14, 2022 ruling ("ALJ ruling") in this case, setting March 24, 2022 as the filing and service date for PG&E's supplement proposal for an export compensation mechanism for non-NEM customers, Pacific Gas and Electric Company ("PG&E") submits its export compensation proposal (Proposal) for consideration of the parties and the Commission. The Proposal will be served on the service list for A.20-10-011 concurrently with this filing. PG&E will provide additional information on its Proposal in direct testimony due April 13, 2022. The Proposal will also be among the topics for the Meet and Confer scheduled for March 29, 2022, pursuant to PG&E's notice served February 24, 2022 in this docket.

Respectfully Submitted,

GAIL L. SLOCUM
SHIRLEY A. WOO
BEN ELLIS

By: /s/ Shirley A. Woo
SHIRLEY A. WOO

Pacific Gas and Electric Company
77 Beale Street
San Francisco, CA 94105
Telephone: (415) 830-7742
Facsimile: (415) 973-5520
E-Mail: Shirley.Woo@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: March 24, 2022

Application: 20-10-011
(U 39 E)
Exhibit No.: _____
Date: March 24, 2022
Witness(es): Erica Brown
Quinn Nakayama

PACIFIC GAS AND ELECTRIC COMPANY

**COMMERCIAL ELECTRIC VEHICLE DYNAMIC RATE OPTION
PROPOSAL FOR EXPORT COMPENSATION MECHANISM FOR
NON-NET ENERGY METERING BUSINESS ELECTRIC VEHICLES**

SUPPLEMENTAL TESTIMONY



PACIFIC GAS AND ELECTRIC COMPANY
COMMERCIAL ELECTRIC VEHICLE DYNAMIC RATE OPTION
PROPOSAL FOR EXPORT COMPENSATION MECHANISM FOR
NON-NET ENERGY METERING BUSINESS ELECTRIC VEHICLES
SUPPLEMENTAL TESTIMONY

TABLE OF CONTENTS

Chapter	Title	Witness
1	POLICY	Erica Brown
2	PILOT PROPOSAL	Quinn Nakayama
3	RESPONSES TO ALJ QUESTIONS	Erica Brown
Appendix A	STATEMENTS OF QUALIFICATIONS	Erica Brown Quinn Nakayama

PACIFIC GAS AND ELECTRIC COMPANY

CHAPTER 1

POLICY

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 1
POLICY

TABLE OF CONTENTS

A. Introduction..... 1-1

B. CAISO Market Participation Export Pilot Overview..... 1-2

C. Assessment Principles and Recommendation 1-4

D. Additional Considerations..... 1-9

1 **PACIFIC GAS AND ELECTRIC COMPANY**
2 **CHAPTER 1**
3 **POLICY**

4 **A. Introduction**

5 Pacific Gas and Electric Company (PG&E) provides this supplemental
6 testimony describing its proposal for an export compensation mechanism for
7 customers enrolled in the Day-Ahead Hourly Real Time Pricing (DAHRTP) rate
8 that do not participate in Net Energy Metering (NEM), but provide exports from
9 behind-the-meter (BTM) resources, as directed by the California Public Utilities
10 Commission (CPUC or Commission) in Application 20-10-011.¹ This chapter
11 first provides an overview of PG&E's proposed market participation Business
12 Electric Vehicle (BEV) pilot and our rationale for proposing to pilot a California
13 Independent System Operator (CAISO) market participation aggregation over
14 other options. As part of this discussion, PG&E presents a list of principles we
15 used in developing this proposal and that can be used to broadly assess
16 Distributed Energy Resource (DER) technologies, programs, tariffs, or
17 incentives. Finally, PG&E identifies key considerations the CPUC should
18 address as PG&E implements a market participation export pilot program and
19 answers the clarifying questions posed by Administrative Law Judge (ALJ) Sisto.

20 This proposal has been developed with the intention not only to address
21 DAHRTP export, but to respond broadly to the Commission's emerging policies
22 for grid participation of BTM resources. In a high DER future, options for both
23 retail and wholesale participation of BTM resources will likely be considered in
24 order to support the state's energy and environmental goals. Our grid, designed
25 for unidirectional energy delivery, is in the nascent stages of evolution towards a
26 smart grid designed for delivering, receiving, and transmitting energy. At this
27 stage in its evolution, PG&E strongly believes that a market participation export
28 pilot will provide the most efficient and impactful research to inform future policy,
29 technological, operational and strategic decisions for all stakeholders involved.

1 Assigned Commissioner's Amended Scoping Memo issued December 17, 2021, and the ALJ e-mail ruling granting extension requests and amending procedural schedule issued January 14, 2022.

1 **B. CAISO Market Participation Export Pilot Overview**

2 PG&E proposes to partner with DER/Electric Vehicle (EV) providers and
3 CAISO to pilot compensating Electric Schedule BEV customers for exports to
4 the grid through the CAISO market. While CAISO currently has market
5 participation models available for aggregated export of BTM resources including
6 EV into the CAISO market, PG&E is aware that participation in these models is
7 low or does not exist due to hurdles including lack of expertise, lack of data, and
8 metering issues.² Through this pilot, PG&E believes that it can play a pivotal
9 role in overcoming some of the hurdles that currently prevent BTM generation
10 aggregators from participating in this program.

11 A more complete description of the proposal can be found in Chapter 2, but
12 at a high level the proposed pilot will reflect the following:

- 13 • Description: The pilot will compensate BTM EVs' exports through market
14 awards based on results from the CAISO market—day-ahead and/or
15 real-time prices.
- 16 • Pilot Objectives: The pilot's objective includes understanding customer
17 discharge behavior to inform potential system and local Resource Adequacy
18 (RA) valuation. Other objectives are to develop and understand cross-entity
19 communication strategies (e.g., between and among customers, aggregator,
20 distribution system operator (DSO), and CAISO), including understanding
21 potential software and hardware needs to facilitate communications and
22 dispatch.
- 23 • Eligibility: Eligible customers must be non-NEM on the BEV rate schedules
24 and must meet CAISO minimum bid requirements either individually or
25 through aggregators.³ Although the Commissioner's ruling limited the
26 proposal to BEV customers on the DAHRTP rate, this PG&E pilot includes
27 customers on any BEV rate schedule and not only to DAHRTP Commercial
28 Electric Vehicle (CEV) customers. This will allow for a larger pool of

2 Final Report of the California Joint Agencies VGI Working Group. June 06, 2020.
CPUC (Rulemaking (R.) 18-12-006).

3 PG&E believes the additional metering and billing requirements necessary to ensure
NEM integrity and to avoid duplicate compensation warrant future exploration.
Addressing those additional hurdles at this time will unnecessarily hamper the pilot.

1 participants and better facilitate learning about differences in behavior
2 between different types of customers.⁴

- 3 • Compensation: All compensation for energy will come from the CAISO
4 market participation entity on cleared schedules and awards. Compensation
5 for RA will be provided, if available and where appropriate. Participation
6 incentives will be considered.
- 7 • Cost Recovery: PG&E does not propose a definitive budget for this pilot in
8 this testimony. We do not propose a budget at this time for two reasons:
9 (1) there are multiple pilot proposals related to EV export and real-time
10 day-ahead rates that have crossover with this pilot proposal currently before
11 the Commission, and we need additional time to ensure that each dollar is
12 optimized, and (2) the blueprints of the pilot, relating to technology,
13 aggregator participation, and size of pilot are all going to be developed
14 further in the workshops and will impact the level of incentive and overall
15 budget needed for the pilot to be successful.
- 16 • Evaluation: PG&E proposes cost-effectiveness evaluation and will issue a
17 report on lessons learned two years after implementation to inform future
18 program funding. PG&E notes that San Diego Gas & Electric Company
19 (SDG&E) proposed a retail bill compensation approach for non-NEM exports
20 in December 2021. If both SDG&E's rate and PG&E's pilot are approved,
21 the Commission could coordinate evaluation of both programs to understand
22 the relative benefits and drawbacks of each.

23 PG&E proposes that the Commission order PG&E to implement an
24 application and stakeholder workshop process in the quarter following the final
25 decision to further develop the pilot in coordination with industry, CAISO,
26 interested load serving entities, and other impacted stakeholders. PG&E will file
27 an Advice Letter (AL) outlining pilot details after the stakeholder process and will
28 provide additional details regarding the timing of that AL in PG&E's April 13,
29 2022, direct testimony.

4 As of March 4, 2022, there were 429 BEV service agreements which belong to 131 different companies. Four-hundred and twenty-seven of the service agreements were non-NEM.

C. Assessment Principles and Recommendation

PG&E is supportive of non-NEM BTM generation compensation as a tool to benefit both the grid and the customer-generator, and believes newer technologies and expanded uses of existing technologies have the potential to increase the value of non-NEM BTM generation. PG&E supports pilots, rates, and programs to test new technologies and expanded uses of existing technologies, to facilitate customer adoption, and to obtain data and information for evaluation and improvement. To inform decision-making about how to design and evaluate these BTM programs, tariffs, and proposals, PG&E has developed a set of principles. This section describes these principles and how they support our CAISO market participation export pilot proposal.

PG&E's principles for designing and evaluating BTM programs, including export compensation for BEVs, are:

- 1) Level Playing Field: Support consistency between supply and demand side resource valuation to ensure customer affordability; also support valuation consistency between different technologies and programs.
- 2) Equity: DER policies, programs, and pilots benefit all customers equitably. This will help ensure that any cost shifts are minimized, that cost-shifts are not regressive, and that participating customers pay for services that they receive. Where feasible and appropriate, program design includes options for income-qualified customers.
- 3) Appropriate Compensation: Participants are compensated for ratepayer value delivered, meaning compensation is based on incremental value and measured actual performance. In general, programs with clear procurement targets, transparent compensation and competitive bidding are preferable to open-ended tariffs or rate riders.
- 4) Simplicity: Support consolidating, combining, and simplifying programs to make participation easy and effortless for all our customers. This ensures reducing implementation costs, supporting transactional efficiency, avoiding duplicative programs and pilots, and minimizing confusion for customers.

- 1 5) Evaluation: Consistent, accurate, and transparent assessment of results
2 using appropriate Standard Practice Manual cost-effectiveness tests.⁵
3 Program design includes collection of data to support appropriate
4 cost-effectiveness evaluation.
- 5 6) Safety and Reliability: Maintain or enhance system safety, security, and
6 reliability as grid complexity increases due to both DER integration and the
7 dynamic nature of the electric distribution system. This includes visibility
8 and clear, detailed guidance for grid participation where regulatory
9 jurisdictional conflict may exist. Programs must comply with all relevant
10 interconnection tariffs.
- 11 7) Learn Before You Leap: New programs to deploy DERs should be studied
12 first to improve ultimate program design and avoid unintended
13 consequences. Pilots need clear objectives, clear measures of success,
14 and clear evaluation criteria. Pilots also need limited scope and a clear
15 timeframe for the choice between termination, modification, or expanded
16 implementation. The decisions to move from pilots to scale must include
17 stages and should consider cost effectiveness and ability to meet DER
18 principles if continued or expanded.

19 PG&E notes that not all principles can be met equally by all programs, but
20 they should be considered in all cases and where a principle cannot be satisfied,
21 explanation would be necessary. For example, the proposal in this filing does
22 not fully meet the first two principles (Level Playing Field and Equity) or the
23 fourth principle (Simplicity).⁶ However, the Commission may still consider this
24 pilot because (1) it supports California's priority of EV adoption by developing a
25 new opportunity to monetize those assets, (2) it provides a new opportunity for
26 DERs to support the grid, and (3) the costs and equity impacts are limited for a
27 pilot program.

5 <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/energy-efficiency/idsm>.

6 Pilots in and of themselves cannot provide a level playing field because they are designed as a sandbox for testing programs and serving as potential incubator for innovation. The pilot proposed here does not have an equity component because it is focused on BEV customers. It is not clear whether retail bill-based compensation or working with an aggregator is simpler for customers, and pilots are meant to gather data that will help with this determination.

1 In developing this proposal, we considered two alternatives for a non-NEM
2 BEV export compensation pilot: (1) a CAISO market participation export pilot as
3 proposed here and (2) export compensation on customers' retail bills through a
4 rate element. Compared to a retail bill compensation program, PG&E believes a
5 market participation export pilot provides the best long-term value for customers
6 (Principles 1 and 3), best supports grid reliability (Principle 6), and is more suited
7 to California's retail choice model (Principle 4). As the distribution grid operator,
8 our principal concern is to maintain the safety and reliability of the grid.

9 Therefore, in accordance with Principle 7 (Learn Before You Leap), we strongly
10 believe that a pilot is an important first step towards DER integration under any
11 circumstances where customer behavior, technological capabilities, and grid
12 roles and responsibilities are untested.

13 Best Value for Customers in the Long-term: Scarcity Pricing and Pilot Learnings

14 CAISO market participation best supports long-term value for customers
15 because dispatchable resources could be compensated at high energy prices
16 during real-time scarcity events. While this pilot may ultimately recommend
17 dispatch in the day-ahead market, the lessons learned here may inform future
18 programs that allow for real-time dispatch and allow aggregated EVs to be
19 compensated at energy prices in the real-time market, whether high or low. This
20 may reduce energy costs for non-participants and would likely reduce the use of
21 natural-gas fired generation.

22 While PG&E believes that CAISO market participation provides the best
23 long-term value for customers, we understand that there are challenges to
24 evaluating vehicle-grid integration (VGI). The Commission described these
25 challenges in its VGI Working Group report, including:

- 26 • Limited insight into the costs of VGI resources and limited availability of cost
27 data;
- 28 • Limited expertise by many participants in storage and other DERs;
- 29 • Lack of time and resources to conduct the necessary quantitative analytics
30 and literature reviews; and

- Lack of a developed framework and analysis criteria to make true “apples-to-apples” comparisons.⁷

Our pilot seeks to address these challenges and identify best practices for how EV batteries and BEV customers with non-NEM and non-fossil fuel resources can support the grid.

Best Supports Grid Reliability: Operational Flexibility and Control

Market integration provides more efficient visibility and predictability for the grid operator by allowing schedules to be reviewed by the DSO prior to being dispatched, which allows the DSO to review proposed DER behavior against current and future distribution grid conditions and configurations for the identification of any safety considerations that need to be considered. While developing similar visibility and control processes and rules for a retail compensation mechanism may be possible, it would require establishing tariffed requirements for dispatch and communication and potential IT infrastructure costs in developing communication pathways between the DSO and either the individual owners or control aggregators (e.g. inverter companies – not to be confused with a market aggregator such as a scheduling coordinator), which would be costly and lacks some of the benefits of a market participation approach.

Visibility and control are important to ensure the reliable and safe operation of the grid, particularly as more customers adopt distributed generation technologies. The distribution system is highly dynamic, as customers and the load can be transferred from one circuit to another (known as ‘abnormal circuit configurations’) in order to minimize customer outages to execute planned distribution work, or to expedite restoration of customer outages due to unplanned events. While the distribution system, and its customers, are in normal configuration, PG&E’s interconnection processes analyze and set the rules by which the DERs can perform activities without creating reliability or safety concerns. However, in abnormal circuit configuration, such activities have the potential to create overloads or power quality issues that could impact other customers on the circuit. By allowing a DSO to review a market aggregator’s

⁷ Final Report of the California Joint Agencies VGI Working Group. June 06, 2020. CPUC (R.18-12-006). https://www.gridworks.org/wp-content/uploads/2020/09/GW_VehicleGrid-Integration-Working-Group.pdf.

1 units and schedules prior to submitting the schedules to the CAISO, the DSO
2 has the opportunity to identify not just whether participating resources are on
3 circuits that are on abnormal configurations. The DSO could also identify when
4 those potential dispatches could be occurring, determine if there are any safety
5 or reliability concerns based upon the peaks and off peaks of the circuit load,
6 and work with the aggregator to ensure any concerns are addressed.
7 Furthermore, the DSO can work with a smaller number of market aggregators in
8 real time to curtail or disable any export activities if conditions are warranted to
9 ensure safe and reliable service for all who utilize the distribution system.
10 Finally, by interacting with market aggregators, the DSO can significantly
11 simplify communication pathways between the DSO and the DERs. As
12 resources are scaled to perform these capabilities, it may not be practical nor
13 cost-effective to have a DSO communicate and control individual resources (and
14 the customer cost-burden for the necessary control and communication
15 hardware would be high), and therefore working through an aggregator via a
16 market participation model may generate the right balance of maintaining
17 system integrity, reliability, and safety, in a cost-effective fashion. In contrast
18 with a retail based approach, while the DSO may know *where* the units are, they
19 will not know *when* nor *if* the units will be exporting, which makes load
20 predictability a significant challenge to ascertain whether units on circuits in
21 abnormal configuration would pose a potential safety or power quality condition.
22 This may require the DSO to take more conservative measures in order to
23 maintain grid integrity and reliability for all customers being served on the circuit.
24 Suitability to California's Retail Choice Model: Equal Opportunity for Bundled
25 and Unbundled Customers

26 A market participation option will provide clear signaling across bundled and
27 unbundled customers, while optimizing for higher levels of participation.
28 Customers in PG&E's territory can receive their generation supply from PG&E,
29 Community Choice Aggregators, or direct access providers (Electric Service
30 Providers) (together retail Load Serving Entity (LSE)).⁸ By providing a market
31 participation export option to our BEV customers instead of a tariff rate program,

⁸ Over half the customers in PG&E's service territory receive generation supply from Community Choice Aggregators or Energy Service Providers.

1 we avoid requiring each retail LSE provider to offer its own tariff rate program for
2 its unbundled customers, which could complicate the customer experience and
3 diminish the effectiveness of each program by reducing the participant pool and,
4 potentially, the participant load diversity. CAISO market participation provides
5 greater flexibility for customers selling their energy. Under a retail bill-based
6 approach, each LSE would procure energy through the retail bill from its
7 customers; under a CAISO market participation approach the customers could
8 sell their energy and associated products to any LSE via an aggregator similar to
9 how supply-side generators can sell their energy to any LSE. CAISO market
10 participation makes implementation simpler from an administrative point of view
11 and avoids potential confusion due to a multitude of export rates, if each LSE
12 had to provide its own rate for non-NEM BTM exports that place uninstructed
13 energy on the grid.

14 **D. Additional Considerations**

15 PG&E understands that a market participation export proposal will
16 necessitate addressing several key considerations and looks forward to working
17 with shareholders to create a path forward that enables an effective market
18 participation approach to capturing the value of BEV resources to meet
19 California's goals. While the presentation of considerations that must be
20 addressed are discussed from the perspective of a market participation
21 approach, PG&E notes that these same considerations would need to be
22 addressed by the CPUC for any program trying to capture the value of exports to
23 the grid from BEVs. The key considerations are discussed below.

24 Interconnection Jurisdiction: There may be a jurisdictional overlap for BTM
25 customer assets interconnecting to the distribution grid, and dispatching to the
26 CAISO market. While BTM assets generally interconnect through a CPUC
27 regulated process (i.e., Rule 21), transmission connected and market
28 participating assets are regulated by Federal Energy Regulatory Commission
29 (FERC) jurisdictional rules. FERC recently addressed the challenges DERs face
30 in interconnecting for market participation, explaining that it is unduly
31 burdensome to expect all market participating DERs to meet their most stringent

interconnection rules.⁹ With improved standardization in this space, stakeholders can find common ground that safely integrates these resources.

Resource Adequacy: As noted previously, resources participating in this pilot would be paid a capacity price where available and appropriate. However, the current CAISO DER market export model does not provide a clear methodology for RA compensation for BTM resources. Proposals from stakeholders have suggested various approaches to RA recognition for these resources;¹⁰ however, PG&E understands that several issues remain unresolved including DER deliverability, impacts on state of charge of the batteries, and communication protocols between responsible parties.

Establishing a methodology to compensate exporting non-NEM DERs is further complicated by anticipated RA rules changes: the CPUC is currently reviewing updates to the RA program in R.19-11-009. Newly proposed rules, including the 24-hour slice of day proposal, could have significant implications for BTM resources, enabling valuation of resources outside of the peak and net peak periods. Notwithstanding these challenges, PG&E believes that the learnings from this pilot (e.g., remaining state of charge post business operations and time of day that a vehicle would be available for export) could inform how to value capacity from exporting distributed resources going forward as discussed in more detail in Chapter 2.

Customer receptivity: Capturing the value of exports from EVs is a nascent enterprise. Any program will require education, even for large, relatively sophisticated customers. It is unclear how customers will respond to the economic incentives provided by export remuneration. For example, a delivery vehicle may have constraints on export given that it must be at a certain level of charge to be fully capable for its next day business operations. The pilot development and implementation process should include funding for marketing, education and outreach and general training for customers interested in participating.

Customer revenue generation: Current CAISO market participation models that allow for export do not provide RA for BTM resources. Nevertheless, there

⁹ CAISO Corp., 155 FERC ¶ 61,229 (2016).

¹⁰ Joint DER Parties Implementation Track – Phase 2 Proposal. R.21-10-002. January 21, 2022.

1 is potential for customers to achieve revenue from multiple sources (e.g., Low
2 Carbon Fuel Standard); participation in multiple programs needs to be monitored
3 to make sure that double compensation or subsidies do not occur. Once other
4 considerations above begin to be resolved, customer revenue generation should
5 become more self-evident and access to revenue streams by providers should
6 be more straightforward.

PACIFIC GAS AND ELECTRIC COMPANY

CHAPTER 2

PILOT PROPOSAL

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 2
PILOT PROPOSAL

TABLE OF CONTENTS

A. Pacific Gas and Electric Company Business Electric Vehicle Real Time
and Day-Ahead Export Pilot 2-1

B. Costs of the Pilot 2-4

1 **PACIFIC GAS AND ELECTRIC COMPANY**
2 **CHAPTER 2**
3 **PILOT PROPOSAL**

4 **A. Pacific Gas and Electric Company Business Electric Vehicle Real Time and**
5 **Day-Ahead Export Pilot**

6 Pacific Gas and Electric Company (PG&E) proposes to develop a pilot that
7 will provide an upfront incentive, the value of which will be determined through
8 the workshop process, to Business Electric Vehicle (BEV) customers to
9 participate in day-ahead (DA) and day-of California Independent System
10 Operator (CAISO) market conditions. In addition to serving as a controlled
11 experiment in real markets, the pilot will facilitate stakeholder engagement,
12 regulatory refinement (inter-jurisdictional) and industry alignment (e.g., Resource
13 Adequacy (RA) Qualifying Capacity methodology vs. other methods for RA).
14 PG&E has identified three overarching goals for this pilot.

15 The first goal will be to understand behavioral responses to export price
16 signals given constraints such as commercial operations. This will inform how
17 the utility can plan for exports at scale, forecast energy from these resources,
18 and potentially rely on them for RA. The state-of-charge of BEVs when
19 connected to the grid after a full business day's worth of activities will be critical
20 in determining how much energy and capacity is actually available at the net
21 peak and overnight, as well as what type of discharging and charging behaviors
22 a commercial/industrial enterprise will be willing to provide that does not
23 adversely impact their next day's business operations or the operations and
24 maintenance costs of their BEV fleet. For example, delivery services such as
25 Amazon and FedEx will require their BEVs to be out throughout the day and will
26 not be connected to the grid until after hours, with reduced state of charge. How
27 they will want to further discharge and charge their vehicles, and the state of
28 charge available for capacity markets, will be something noteworthy to study.
29 Furthermore, school buses will only be unavailable for morning drop offs and
30 afternoon pickups, but may have a certain willingness to participate in between
31 schedules (as long as such participation does not adversely affect the afternoon
32 pickups), as well as a different willingness to participate after the day's
33 operations is completed. How school buses discharge and charge, as well as

1 the state of charge availability for capacity markets, may be different than
2 delivery vehicles, and will be also noteworthy to study.

3 Understanding customer behavior will also be important to understanding
4 how exporting DERs can contribute to grid reliability in hours when needed. For
5 example, delivery vehicles may still be running business operations during the
6 evening hours and are unavailable during peak usage hours.

7 Extensive work to integrate BTM storage resources has been undertaken by
8 the CAISO in its energy storage and DER initiative. In a recently approved order
9 accepting tariff revisions, the Federal Energy Regulatory Commission (FERC)
10 stated that CAISO's proposal to allow energy storage resources to specify target
11 end-of-hour state of charge levels in the real-time market was just and
12 reasonable.¹

13 This is one example of how the state of play for BTM storage resources is
14 changing. Our pilot will create a much-needed space to study the availability of
15 BEV assets in this paradigm. By observing customer behavior at charging and
16 premise level, we will begin to understand how these resources can provide firm
17 energy and whether they can assess the value of that product for RA.

18 The second goal of the pilot will be to explore and understand potential
19 pathways for operational design regarding dispatch of energy into the CAISO
20 wholesale market from non-net energy BTM resources. As a Distribution
21 System Operator, PG&E is responsible for the safety and reliability of the grid,
22 and we consider that we are well positioned to act as a conduit for testing and
23 researching how the technologies that exist within each use case interact with
24 and affect the distribution grid, the transmission grid, and DA and real-time
25 CAISO markets. Ultimately, each CAISO model that exists today for Distributed
26 Energy Resource (DER) integration will have different impacts on the roles and
27 responsibilities that each party identified has in the operational stack. For
28 example, the Distributed Energy Resources Aggregation model places all
29 responsibility for scheduling the customer load on one of the entities identified.
30 Ultimately, who interacts with the market under a DER participating model will
31 depend on the structure of the CAISO model. The second goal of this pilot will
32 be to explore these roles and responsibilities with stakeholders and to identify

¹ 177 FERC, 61,051. Order Accepting Tariff Revisions. October 26, 2021,p. 11.

the most robust path. Once roles and responsibilities are established, this pilot seeks to begin to understand how aggregated exports will interact and respond to grid needs.

The third goal of the pilot is to continue the work we are doing with stakeholders to define the standards and procedures for metering, submetering, telemetry and telematics of BEV integration as exporting resources. The pilot will rely and build upon significant work already undertaken in the Emergency Reliability Order to Institute Rulemaking (Rulemaking (R.) 20-11-003),² the Electric Program Investment Charge (EPIC) 2.02 DER Management System³ program, and other proceedings to set the parameters for how BTM resources are metered and observed. More specifically, this pilot will work with BEV exporters and aggregators to:

- 1) Continue to mature the methodology for how to translate inverter data into Settlement Quality Meter Data;
- 2) Continue to develop standards for ensuring measurement of device level metering and premise level metering are congruous; and
- 3) Identify the needed incentives and reduce costs for participants to meet metering and telemetry standards.

PG&E's DR Emerging Technology 2021 Virtual Power Plant pilot has already begun important work to study how customers' home battery systems can support grid reliability in times of high electricity demand. Best practices regarding the pros and cons of settlement of load impacts at the device (battery) level vs. the premise meter level will be transferred from that pilot and incorporated into this pilot. Ultimately, this effort will help to create clear standards and procedures for the metering and telemetry of BTM BEV assets in the CASIO market.

Pilot Objectives:

The pilot will:

- Work with EV Original Equipment Manufacturer (OEM)/DER provider companies to track hourly availability and state-of-charge to help us

² Phase 2 Decision Directing PG&E, Southern California Edison Company, and San Diego Gas & Electric Company to Take Actions to Prepare for Potential Extreme Weather in The Summers Of 2022 and 2023. R.20-11-003, October 29th, 2021.

³ EPIC Final Report. January 18th, 2019.

1 understand BEV customer behavior on when, where, and what is available
2 at any given point in time.

- 3 • Work with OEM/DER provider companies to measure what the impacts of
4 state-of-charge are on battery degradation.
- 5 • Measure how customer behavior, vehicle availability, and state-of-charge
6 align with changing rules for RA (i.e., slice of day proposal). As the state's
7 needs shift from peak and net peak (with firm capacity going offline over the
8 next decade), how will BEV export benefit new RA paradigm?

9 PG&E believes that the technological field of play for commercial EVs is
10 large and diverse, the best use of funds for this pilot would be to identify two
11 different customer types (e.g., a school district with buses and a delivery
12 company with EV delivery fleets). Through the stakeholder process we will
13 develop an application process for these fleets to apply and participate in the
14 pilot. Following the application and customer identification process, PG&E
15 requests that the California Public Utilities Commission (Commission) order
16 PG&E to hold a stakeholder process to develop a clear procedure to define key
17 characteristics of the pilot: market participation design, timeline, and a pilot
18 evaluation plan. Engaging with the selected customers, aggregators,
19 Community Choice Aggregation, and other IOUs will be critical to developing a
20 successful pilot.

21 The workshops should include segments on how to structure each use case,
22 the timeline and expected outcomes for each use case, the development of
23 market participation mechanisms for each use case, and incentives for each use
24 case.

25 **B. Costs of the Pilot**

26 PG&E does not have estimated costs for its proposed pilot at this time.
27 PG&E anticipates that definitive cost estimates cannot be prepared and
28 presented in time for the opening testimony due April 13th, 2022, in this case.
29 The proposed workshops will influence the scope and complexity of PG&E's
30 proposed pilot, and cost estimates should wait for the outcome of the
31 workshops. PG&E proposes to submit a more complete description of activities
32 that will comprise the pilot, and a more specific cost recovery mechanism, in
33 opening testimony due April 13, 2022. PG&E also expects to continue providing

- 1 more detail on pilot activities, along with cost estimates and cost recovery
- 2 mechanism, as this proceeding continues to develop specificity on the pilot.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
RESPONSES TO ALJ QUESTIONS

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
RESPONSES TO ALJ QUESTIONS

TABLE OF CONTENTS

A. Administrative Law Judge Questions With Answers..... 3-1

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 3
RESPONSES TO ALJ QUESTIONS

A. Administrative Law Judge Questions With Answers

This section of the proposal addresses the clarifying questions posed by Administrative Law Judge Sisto on January 14,¹ 2022.

Q 1 In Exhibit PG&E 1 at 2 15, Pacific Gas and Electric Company (PG&E) indicates that, for Net Energy Metering (NEM) customers, exports to the grid will be tracked by the hour and given generation compensation equal to that hourly price.

a) Does PG&E propose to use the same export compensation methodology to calculate the export compensation amount for non-NEM customers as it was authorized to offer NEM customers that participate in the [Day-Ahead Hourly Real Time Pricing] (DAHRTP) rate?

b) If not, PG&E should explain the methodology that would be used to calculate the compensation rate for non-NEM customers on the DAHRTP rate that provide exports to the grid and provide a detailed analysis on why the compensation rate for non-NEM should differ from the export compensation rate offered for NEM customers.

A 1 No, we do not propose to use the same export compensation methodology. PG&E proposes a market participation approach for compensation for non-NEM exports. Because there are constraints to current market participation models, PG&E proposes to conduct a pilot that will help provide a test case for optimization of these grid participating resources.

In Chapter 1, Section III of this proposal, we have provided an overview for why the market participation compensation for non-NEM export will provide the best value for customers over the long-term. The distinction between NEM and non-NEM customers are many, principally that the non-NEM Business Electric Vehicle (BEV) customers will be exporting energy from their batteries, from which they could have charged elsewhere

¹ E-mail ruling granting extension requests and amending procedural schedule. Application 20-10-011. January 14, 2022.

1 and not from their own solar photovoltaic, as is the case with NEM stationary
2 battery export. BEV customers will export on a separate or a second meter
3 which serves the charging equipment, which will not preclude them from
4 participating in other programs such as NEM on their first meter that serves
5 premise load.

6 Q 2 For the generation component of the rate rider, will DAHRTP customers
7 (NEM and non-NEM) receive export compensation for the generation price
8 that includes: (1) the [Day-Ahead] market energy price from California
9 Independent System Operator (CAISO), (2) the capacity adder based on
10 forecasted adjusted net load in each hour, and (3) the revenue neutral
11 adder?

12 A 2 The answer to question 3 is no, because PG&E proposes a market
13 participation approach for compensation for non-NEM exports. However,
14 under a market participation approach, the customer will receive CAISO
15 energy prices and, where available and appropriate, Resource Adequacy
16 payments.

17 Q 3 Will DAHRTP customers (NEM and non-NEM) receive export compensation
18 for any other components of the DAHRTP rate (i.e., distribution,
19 transmission, and non-bypassable charges that are part of the Total Energy
20 Rates (\$ per kilowatt hour) of the rate schedule)?

21 A 3 No. Instead, PG&E has proposed this pilot principally to formulate a
22 paradigm in which Distributed Energy Resources (DER), and in this case
23 BEV customers, can receive value for positive contributions that their assets
24 provide to the distribution and transmission grids through a market
25 integrated approach.

26 Q 4 Will PG&E be able to distinguish between exports from behind-the-meter
27 (BTM) solar and exports from other DERs such as bi-directional electric
28 vehicles?

- 29 • If so, how will PG&E differentiate between the exporting resources?
- 30 • Will all exports, regardless of which DER they are from, be
31 compensated at the same rate?

32 A 4 PG&E has proposed a market participation approach for compensation for
33 non-NEM BTM exports in order to allow for more granular and cost-based
34 remuneration. As part of its proposal, PG&E wants to institute an

1 application and workshop process to discuss various topics of which this
2 one would be included. It is PG&E's position that yes, the pilot should
3 distinguish between these types of exports. Additional information can be
4 found in the pilot's third goal in Chapter 2, p. 2-3.

5 Q 5 Will the technical and billing system upgrades PG&E plans to conduct to
6 implement the DAHRTP rate authorized in Decision (D.) 21-11-017 support
7 the potential for export compensation for customers that are enrolled in the
8 DAHRTP rate but do not participate in NEM? If not, what additional
9 investments and associated ratepayer costs does PG&E propose would be
10 necessary to provide export compensation for DAHRTP customers that do
11 not participate in NEM?

12 A 5 The proposed pilot compensation does not use the technical and billing
13 system upgrades PG&E plans to conduct to implement the DAHRTP rate
14 authorized in D.21-11-017. There is no need for PG&E to build a price
15 dissemination platform since the CAISO has a robust system developed for
16 that purpose. In addition, pilot participants will receive their payments
17 outside of the billing system, and will leverage the existing
18 system/processes for compensating other market integrated customers.

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX A
STATEMENTS OF QUALIFICATIONS

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF ERICA BROWN

Q 1 Please state your name and business address.

A 1 My name is Erica Brown, and am currently working remotely as Pacific Gas and Electric Company (PG&E) transitions from its prior location at 77 Beale Street, San Francisco, California to 300 Lakeside Drive, Oakland, California.

Q 2 Briefly describe your responsibilities at PG&E.

A 2 I am the Director of Energy Policy Analysis and Design. In this position, I am responsible for PG&E's position on a variety of energy policy topics including regulations impacting energy procurement (e.g., Renewable Portfolio Standard, Resource Adequacy) and valuation of distributed energy resources (e.g., Avoided Cost Calculator, Net Energy Metering).

Q 3 Please summarize your educational and professional background.

A 3 I earned a Bachelor of Arts in English Literature from New York University and a Master of Public Policy from the University of Michigan.

I have worked at PG&E for 7 years where I have held a variety of energy policy roles. I started my career at PG&E as an analyst working on California Independent System Operator market policy before switching to an analyst position working on California Public Utilities Commission procurement policy. I subsequently moved into a leadership position and have held positions as Manager, Senior Manager, and now Director working on energy policy within the Energy and Procurement Policy department at PG&E.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following supplemental testimony in PG&E's Commercial Electric Vehicle Day-Ahead Real-Time Pricing Application:

- Chapter 1, "Policy"; and
- Chapter 3, "Responses to ALJ Questions."

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.

PACIFIC GAS AND ELECTRIC COMPANY
STATEMENT OF QUALIFICATIONS OF QUINN NAKAYAMA

Q 1 Please state your name and business address.

A 1 My name is Quinn Nakayama, and am currently working remotely as Pacific Gas and Electric Company (PG&E) transitions from its prior location at 77 Beale Street, San Francisco, California to 300 Lakeside Drive, Oakland, California.

Q 2 Briefly describe your responsibilities at PG&E.

A 2 I am the Director of the Integrated Grid Planning and Innovation Department. In this position, I am responsible for leading the development of PG&E's grid strategy and policy around the integration of distributed energy resources and new technologies into PG&E's grid planning, operations, and investment processes.

Q 3 Please summarize your educational and professional background.

A 3 I earned a Bachelor of Science degree in Business Administration from University of California at Berkeley.

I have been with PG&E for 8 years where I have held various leadership positions within electric distribution, including being the Chief of Staff for the Vice President of Electric Distribution, the Senior Manager of the Central Distribution Control Center responsible for the day-to-day operations of the distribution grid, and the director for electric distribution process organization, responsible for work readiness, execution, and budget accountability of the electric distribution portfolio. My current assignment is in the Integrated Grid Planning and Integration organization.

Q 4 What is the purpose of your testimony?

A 4 I am sponsoring the following supplemental testimony in PG&E's Commercial Electric Vehicle Day-Ahead Real-Time Pricing Application:

- Chapter 2, "Pilot Proposal."

Q 5 Does this conclude your statement of qualifications?

A 5 Yes, it does.